Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1. (currently amended): An analyzer or spectrophotometer for the detection of material in a sample comprising:

a source of radiation adapted to direct said radiation at least at said sample, the ~~frequency of said~~ radiation incident on or affected by said sample able to be varied by varying the intensity of the said source radiation;

a detector for detecting at least radiation affected by said sample, said detector having a spectral response able to be varied by biasing the detector and an output depending on radiation incident thereon and said spectral response;

a controller or processor receiving said output, configured or programmed to:

vary the spectral response of said detector using biasing to produce a sweep of detector spectral responses, each spectral response having a cut off wavelength dependent on the intensity of incident radiation and biasing;

for each detector spectral response within the sweep of spectral responses, vary the intensity of said source radiation to produce a sweep of source radiation with a range of ~~frequencies~~ intensities directed at said sample;

~~vary the spectral response of said detector to produce a plurality of detector response frequency bands, wherein each detector response frequency band is tuned to an associated range of frequencies of the source radiation;~~

for each detector ~~response frequency band~~ spectral response within the sweep of spectral responses, obtaining output from the detector resulting from the detection of each of the ~~one or more frequencies of incident~~ source radiation intensities affected by the sample, the detector output for each intensity being influenced by the detector's cut off wavelength at that intensity for that spectral response ~~when the source radiation is varied to contain the range of~~

~~frequencies associated with the detector response frequency band~~, wherein the combination of the detector's outputs at each of the intensities for the sweep of source radiation for each of the spectral responses in the detector sweep provide a combined set of data across a spectrum; and

determine a characteristic of said sample based on said combined set of data ~~output obtained for each detector response frequency band when said detector has detected the reflection from a sample of an associated frequency or range of frequencies of incident source radiation~~.

Claim 2. (canceled)

Claim 3. (currently amended): A method of detecting material in a sample by using radiation directed at a sample and a detector to detect source radiation affected by the sample, the method comprising the steps of;

varying the spectral response of said detector using biasing to produce a sweep of detector spectral responses, each spectral response having a cut off wavelength dependent on the intensity of incident radiation;

directing radiation at said sample,

for each detector spectral response within the sweep of spectral responses, varying the intensity of said radiation incident on or affected by said sample to produce a sweep of source radiation intensities ~~with a range of frequencies~~,

detecting at least radiation affected by said sample using [[a]]the detector,

~~varying the spectral response of said detector to produce a plurality of detector response frequency bands wherein each detector response frequency band is tuned to an associated range of frequencies of the varied source radiation,~~

for each detector ~~response frequency band~~ spectral response within the sweep of spectral responses, obtain output from the detector resulting from the detection of ~~one or more frequencies of incident source~~ each of the radiation intensities affected by said sample ~~when the source radiation is varied to contain the range of frequencies associated with the detector response frequency band~~, the detector output for each intensity being influenced by the detector's

cut off wavelength at that intensity for that spectral response, wherein the combination of the detector's outputs at each of the intensities for the sweep of radiation for each of the spectral responses in the detector sweep provide a combined set of data across a spectrum, and

determining a characteristic of said sample based on said combined set of data ~~output obtained for each detector response frequency band when said detector has detected the reflection from a sample of an associated frequency or range of frequencies of incident source radiation~~.

Claim 4. (previously presented): An analyzer or spectrophotometer as claimed in claim 1 wherein the intensity of said source radiation directed at said sample is varied by varying the voltage or current supplied to the radiation source.

Claim 5. (previously presented): An analyzer or spectrophotometer as claimed in claim 1 wherein the intensity of said source radiation directed at said sample is varied by varying the transmission path between the radiation source and said sample.

Claims 6 - 8. (canceled)

Claim 9. (previously presented): An analyzer or spectrophotometer as claimed in claim 1 wherein the radiation affected by said sample is detected by a photodiode and the spectral response of said output is varied by varying the width of the depletion zone within said diode.

Claim 10. (previously presented): An analyzer or spectrophotometer as claimed in claim 9 wherein the width of the depletion zone within said diode is varied by varying the reverse voltage applied across the diode and the output being the resulting current.

Claim 11. (previously presented): An analyzer or spectrophotometer as claimed in claim 9 wherein said output signal from said detector is amplified and digitized prior to being supplied to said controller.

Claim 12. (previously presented): An analyzer or spectrophotometer as claimed in claim 11 wherein said controller is a microprocessor.

Claim 13. (previously presented): An analyzer or spectrophotometer as claimed in claim 11 wherein said detector is a photodiode detector.

Claim 14. (previously presented): An analyzer or spectrophotometer as claimed in claim 11 wherein said source is a light emitting diode.

Claim 15. (previously presented): An analyzer or spectrophotometer as claimed in claim 11 wherein said source is a tungsten filament lamp.

Claim 16. (previously presented): An analyzer or spectrophotometer as claimed in claim 11 wherein said source is a gas discharge lamp.

Claim 17. (previously presented): An analyzer or spectrophotometer for the detection of material in a sample according to claim 1 further comprising:

a variable transmission path for directing radiation in a first configuration between said source and said sample or in a second configuration between said source and said detector and

wherein, the controller or processor is further configured or programmed to:

control said variable transmission path between first and second configurations,

determine the radiation affected by said sample using said output of said detector,

determine the radiation directly from said source using said output of said detector, and

determine a characteristic of said sample based on said output of said detector in relation to variations in said transmission path.

Claims 18 - 19. (canceled)

Claim 20. (previously presented): An analyzer or spectrophotometer as claimed in claim 17 wherein when said variable transmission path is in the first configuration, radiation passes to said sampling along a sample path and when the variable transmission path is in the second configuration radiation passes directly to said detector along a reference path.

Claim 21. (previously presented): An analyzer or spectrophotometer as claimed in claim 20 wherein said variable transmission path is controlled between said first and second configurations using a blocking member having at least 3 cyclic modes comprising:

a first mode during which said blocking member is operated to control the variable transmission path into said second configuration where said radiation passes along said reference path,

a second mode during which said blocking member is operated to control said variable transmission path into said first configuration where said radiation passes along said sample path, and

a third mode during which said radiation is blocked.

Claim 22. (previously presented): An analyzer or spectrophotometer as claimed in claim 21 wherein said blocking member is rotatable about a central axis.

Claim 23. (previously presented): An analyzer or spectrophotometer as claimed in claim 22 wherein during said first mode the intensity of said radiation through said sample path is varied.

Claim 24. (previously presented): An analyzer or spectrophotometer as claimed in claim 23 wherein the intensity is varied by providing different sized apertures in an annular path through said blocking member.

Claim 25. (previously presented): An analyzer or spectrophotometer as claimed in claim 24 wherein said blocking member includes indexing and a sensor(s) to detect the position of said blocking member.

Claims 26 - 28. (canceled)

Claim 29. (currently amended): An analyzer or spectrophotometer as claimed in claim 1 wherein the intensity of the source radiation is varied by switching the source on, the transition from the off state to the on state resulting in a range of source radiation intensities that produces source radiation ~~at a range of frequencies~~.

Claim 30. (currently amended): A method as claimed in claim 3 wherein the intensity of the source radiation is varied by switching the source on, the transition from the off state to the on state resulting in a range of source radiation intensities ~~that produces source radiation at a range of frequencies~~.

Claim 31. (previously presented): A method as claimed in claim 3 wherein the intensity of the source radiation directed at said sample is varied by varying the voltage or current supplied to the radiation source.

Claim 32. (previously presented): A method as claimed in claim 3 wherein the intensity of said source radiation directed at said sample is varied by varying the transmission path between the radiation source and said sample.

Claim 33. (previously presented): A method as claimed in claim 3 wherein the radiation affected by said sample is detected by a photodiode and the spectral response of said detector is varied by varying the width of the depletion zone within said diode.

Claim 34. (previously presented): A method as claimed in claim 33 wherein the width of the depletion zone within said diode is varied by varying the reverse voltage applied across the diode and the output being the resulting current.

Claim 35. (previously presented): A method as claimed in claim 3 wherein said output from said detector is amplified and digitized prior to being supplied to said controller.

Claim 36. (previously presented): A method according to claim 3 wherein the radiation transmission path is varied to direct radiation between said source and said sample in the first configuration or between said source and said detector in the second configuration, wherein the controller or processor is further configured or programmed to:

control a variable transmission path in said first configuration,

control a variable transmission path in said second configuration,

determine the output of the said detector in said first configuration,

determine the output of the said detector in said second configuration, and

determine a characteristic of said sample based on the difference of said outputs of said detector.

Claim 37. (previously presented): A method as claimed in claim 36 wherein when said variable transmission path is in the first configuration, radiation passes to said sample along a sample path and when the variable transmission path is in the second configuration, radiation passes directly to said detector along a reference path.

Claim 38. (previously presented): A method as claimed in claim 37 wherein said variable transmission path is controlled between said first and second configurations by controlling a blocking member into one of at least 3 cyclic modes comprising:

a first mode during which said blocking member is operated to control said variable transmission path into said first configuration where said radiation passes along said sample path,

a second mode during which said blocking member is operated to control the variable transmission path into said second configuration where said radiation passes along said reference path, and

a third mode during which said radiation is blocked.

Claim 39. (previously presented): A method as claimed in claim 38 wherein said blocking member is controlled into one of the modes by rotating the blocking member about a central axis.

Claim 40. (previously presented): A method as claimed in claim 39 further comprising varying the intensity of said radiation through said sample path during the first mode.

Claim 41. (previously presented): A method as claimed in claim 40 comprising varying the intensity by providing different sized apertures in an annular path through said blocking member.

Claim 42. (new): An analyzer or spectrophotometer as claimed in claim 1 wherein;

as the intensity of source radiation increases for a particular spectral response of the detector, the intensity of the affected radiation increases resulting in the detection of a decreased range of wavelengths by the detector, and

as the intensity of the source radiation decreases for a particular spectral response of the detector, the intensity of the affected radiation decreases resulting in the detection of an increased range of wavelengths by the detector,

such that the combined set of data, being a combination of outputs from the detector at different intensities and spectral responses, provides information based on incident radiation detected at a range of different bandwidths by the detector.